The Development of the U.S. Army Tele-Neurosurgery Consultation Network

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Walter Reed Army Medical Center, Washington, DC
North Atlantic Regional Medical Command

Background

The National Capital Consortium (NCC) Neurosurgical Program is the largest neurosurgical clinical service and quaternary referral center in the Department of Defense with all essential neurosurgical subspecialties represented on the faculty, providing care of over 10,000 patients yearly for all forces of the US military services.

Through Congressionally-mandated Defense and Veteran Head and Spinal Injury Program, the NCC is also in the process of becoming a Center of Excellence for comprehensive clinical care, resident training and academic research on head and spinal cord and column injuries in the US Defense system.

4 Missions

- Patient Care
- Education
- Research
- Readiness

NEURO-TRAUMA

Accounts for 20-25% of all combat casualties

532 injuries (both WIA and NBI)

- Extremity 349 (66%)
- Head/neck/eye 74 (14%)
- Spine 31 (6%)
- Chest 27 (5%)
- Abdominal 26 (5%
- Cranial 25 (5%)

182 Procedures

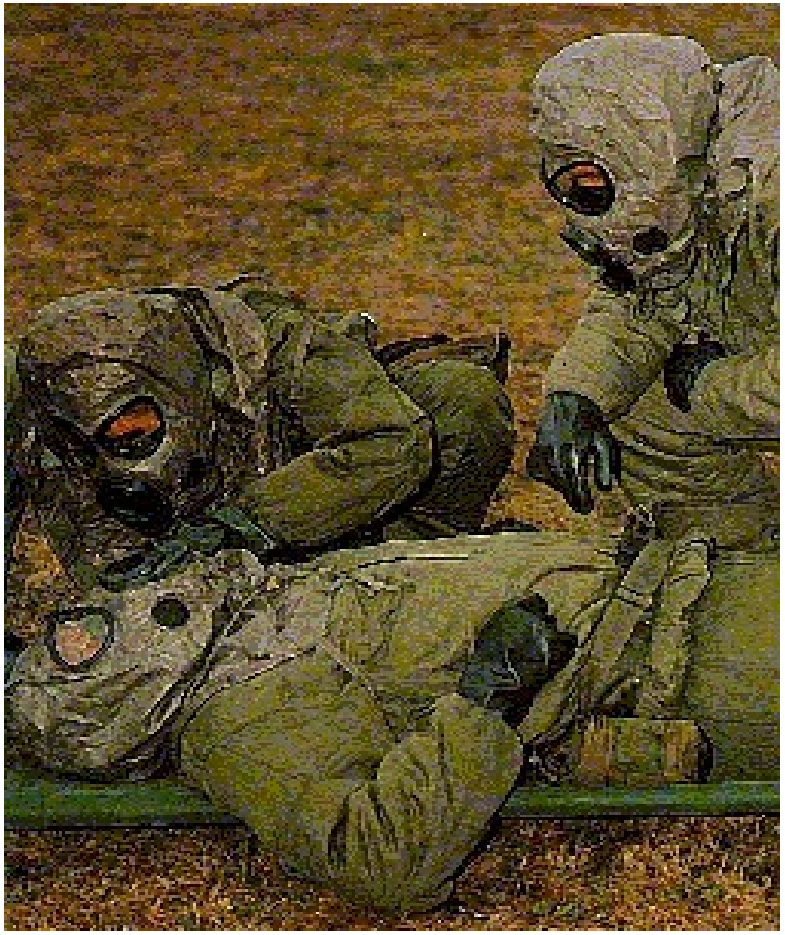
- 84 Cranial
- 20 Cervical
- 40 Spine
- 30 Angiograms
- 8 Vascular repairs
- ~50 % Coalition

Neurosurgery Combat Cases

- 10 cranial
  - 5 coalition (4 WIA, 1 accident)
    - All GSW/Fragment
  - 5 Iraqi
    - 4 GSW/Fragment
    - 1 SDH
- 5 Spine- All GSW/Frag
  - 2 Ex-lap Explorations
  - 2 Cervical
  - 1 Lumbar

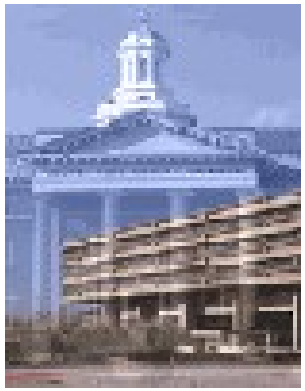
BATTLEFIELD CARE IS DIFFERENT THAN PEACETIME AND CIVILIAN CARE

- Different types of wounds
  - Majority are Penetrating
- Fewer medical resources available in the early “golden hour”
- Early Care delivered remote from advanced resources in any environment (arctic, desert, mountains, undersea, space)
- Ability to reach higher levels of medical care delayed



Evacuation

- Delays in evacuation
  - 1-4 hrs in OIF
  - 13 hrs in OEF
  - 4.5 hrs in Desert Storm



Participating Sites

- Central Receiving Site
  - Walter Reed Army Medical Center, DC
- Stateside Referring Sites
  - Fort Knox, KY
  - Fort Bragg, NC
  - Fort Drum, NY
  - West Point, NY
- Overseas Referring Sites
  - Hanover, Germany
  - Camp Doha, Kuwait
  - U.S. Army, Afghanistan Field Units

47th CSH – Camp Wolf, Kuwait (>90% War phase admissions)

- 816 inpatient admissions
  - 7 British
  - 4 DoD civilian
  - 3 Kuwaiti
  - 1 Ukrainian
- WIA- 305 (37%)
  - Penetrating trauma 268 (88%)
  - Blunt trauma 37 (12%)
- DNBI 511 (63%)
- 1 Death
  - Carotid Injury with dominant hemisheric infarct

252nd Neuroteam- Camp Doha, Kuwait

- 297 Consults (1 May- 25 Sept 03)
  - 154 Lumbar Pain/Radic
  - 34 Cervical Pain/ Radic
  - 34 Non-op CHI
  - 15 Spine Fx- (4 C, 1 T, 9 T-L, 1 L)
- 19 Operative Interventions
    - 16 US/Coalition,
    - 1 Iraqi, 2 UN workers
  - 4- GSW/Fragment Head
  - 7- Skull Fractures
  - 3- EDH
  - 1 Tumor
  - 2 Scalp Lacerations
  - 2- Ventriculostomies

207th Neuroteam
(mid April-4 Feb)

- 280 Admissions
  - 79 PHI (44 US/Coalition, 35 Iraqi)
    - 74% fragment (RPG/ IED)
    - 26% GSW
  - 62 CHI
  - 28 Penetrating Spine
  - 24 Closed Spine
  - 29 Penetrating Neck/Face
  - 11 ODSF
  - 20 Non traumatic tumor/hydrocephalus/etc

Technology Used

Video Teleconferencing

NARMC Telehealth Portal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://160.151.186.70/portal_validate/loginAction.jsp
Go Links
NARMC Telemedicine Directorate
Telehealth Portal
Monday, Mar 8, 2004
Welcome to the Telehealth Portal
Login
User Name :
Password :
Login
Request new password
Register as a new user
Please select a user type :
Health Care Provider
Administration
Patient
Guest
Disclosure Statement
ATTENTION: This is a Department of Defense (DOD) computer system. Before processing classified information, check the accreditation level of this system. Do not process, store or transmit information classified accredited above the accreditation level of this system. This computer system, including all related equipment, networks and network devices (includes Internet access), are provided only for authorized U.S. Government use. DOD Computer Systems may be monitored for all lawful purposes, including to ensure that their use is authorized, for management of the system, to facilitate protection against unauthorized access, and to verify security procedures, survivability and operational security.
Monitoring includes, but is not limited to, active attacks by authorized DOD entities to test or verify the security of the system. During monitoring, information may be examined, recorded, copied and used for authorized purposes. All information, including personal information, placed on or sent over this system may be monitored. Use of this DOD computer system, authorized or unauthorized, constitutes consent to monitoring of this system. Unauthorized use may subject you to criminal prosecution. Evidence of unauthorized use collected during monitoring may be used for administrative, criminal or other adverse action. Use of this system constitutes consent to monitoring for all lawful purposes.
Done
Internet
start
040308 Tom's WAR - ...
Inbox - Microsoft Out...
Microsoft PowerPoint ...
NARMC Telehealth Po...
fantastic offer - Micro...
3:04 PM

Secure Web-base Store-and-Forward

VTC Platform

- Most Locations Polycom 680 iPower

  (384 Kbps ISDN H.320 connection)

- Afghanistan:

  Polycom VSX 7000

  (384 Kbps IP H.323 connection)

- Sites provided a Canon

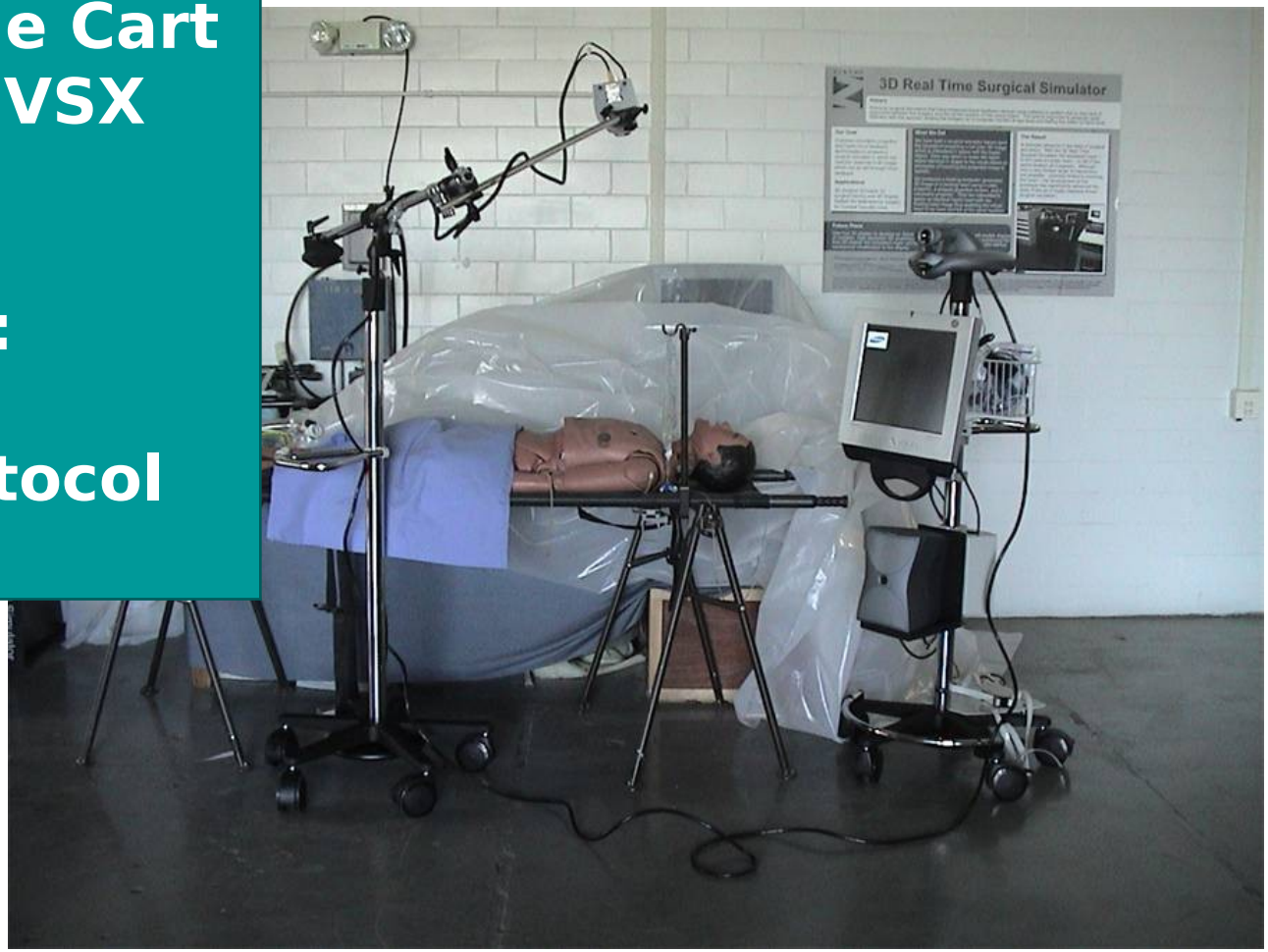
  DZ-3600U Digital Document Camera

Afghanistan Support

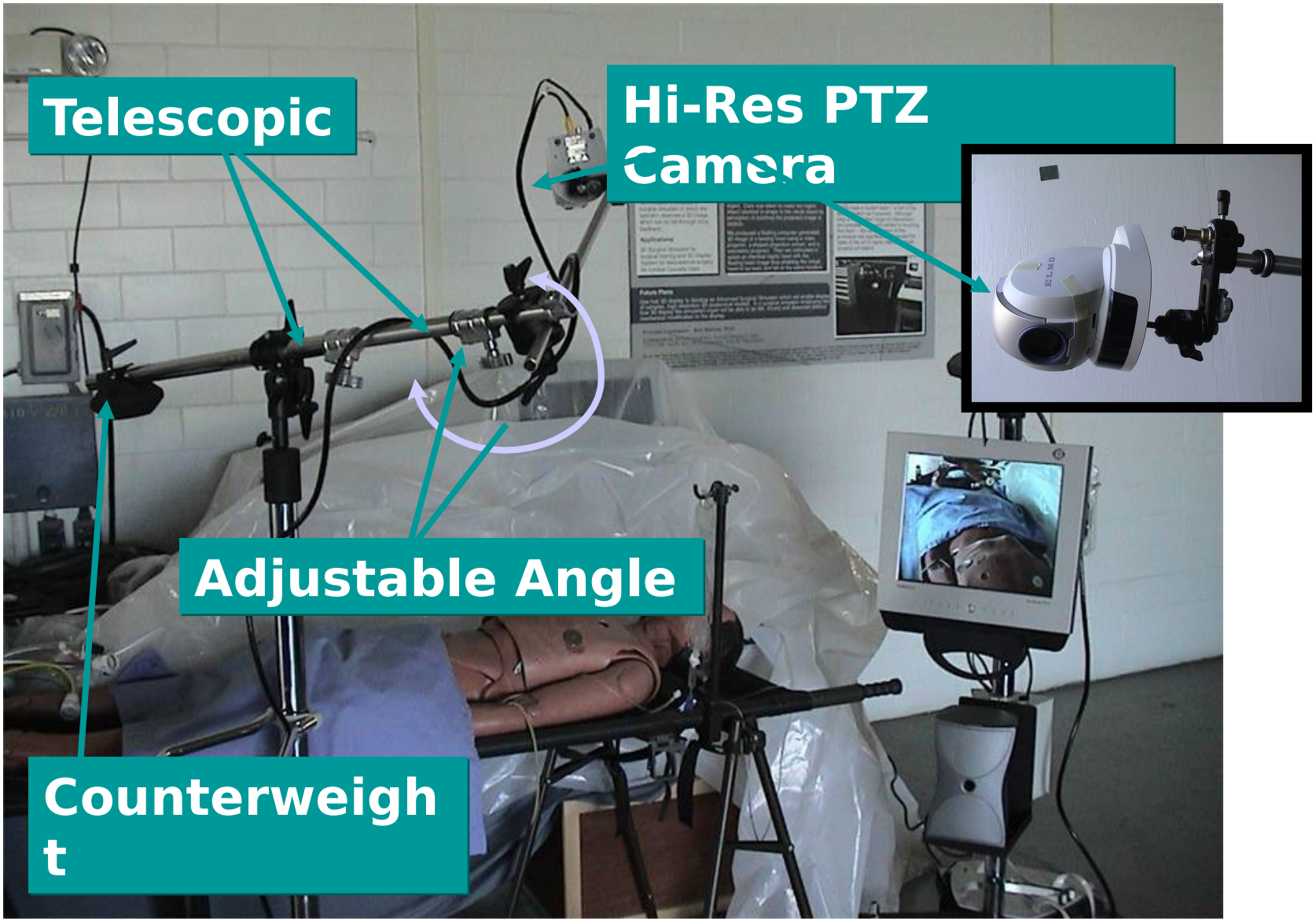
VTC System Shipped with “PT Lumber” for International Shipment

Afghanistan VTC Platform

- **Wire One Pole Cart with Polycom VSX 7000 Codex**
- **Connectivity:**
  - **384 Kbps**
  - **H.323 Protocol (IP)**



Afghanistan VTC Platform



Live VTC from Afghanistan

Web-based Platform

Utilizes North Atlantic Regional Command's Telemedicine Health Portal

- Standardized Secure Web Platform Interface for all NARMC Tele-health applications
- Contains over 20 Common Core Modules
- Decreases Application Development Time
- Decreases Application Development Costs
- Decreases Application Maintenance

Web-based Application

- Auto-Load:
  - Patient Demographics
  - Patient Medications
  - Allergies
  - Laboratory Results
- Interface with local enterprise Integrated Clinical Database (ICDB)/Health-eForces system
- Support for File Upload (JPG, MPG, PDF, DOC)
- Produces Govt. Standard Consult Form (SF 513)
- Utilizes JSP Interface with an Oracle Database with redundant mirrored server configuration
- Separate servers for Web Services, Application Code, and Database

Secure Login Process

NARMC Telehealth Portal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://160.151.186.70/portal_validate/loginAction.jsp
Go Links
NARMC Telemedicine Directorate
Telehealth Portal
Monday, Mar 8, 2004
Welcome to the Telehealth Portal
Login
User Name :
Password :
Login
Request new password
Register as a new user
Please select a user type :
Health Care Provider
Administration
Patient
Guest
Disclosure Statement
ATTENTION: This is a Department of Defense (DOD) computer system. Before processing classified information, check the accreditation level of this system. Do not process, store or transmit information classified accredited above the accreditation level of this system. This computer system, including all related equipment, networks and network devices (includes Internet access), are provided only for authorized U.S. Government use. DOD Computer Systems may be monitored for all lawful purposes, including to ensure that their use is authorized, for management of the system, to facilitate protection against unauthorized access, and to verify security procedures, survivability and operational security.
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Internet
start
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Microsoft PowerPoint ...
NARMC Telehealth Po...
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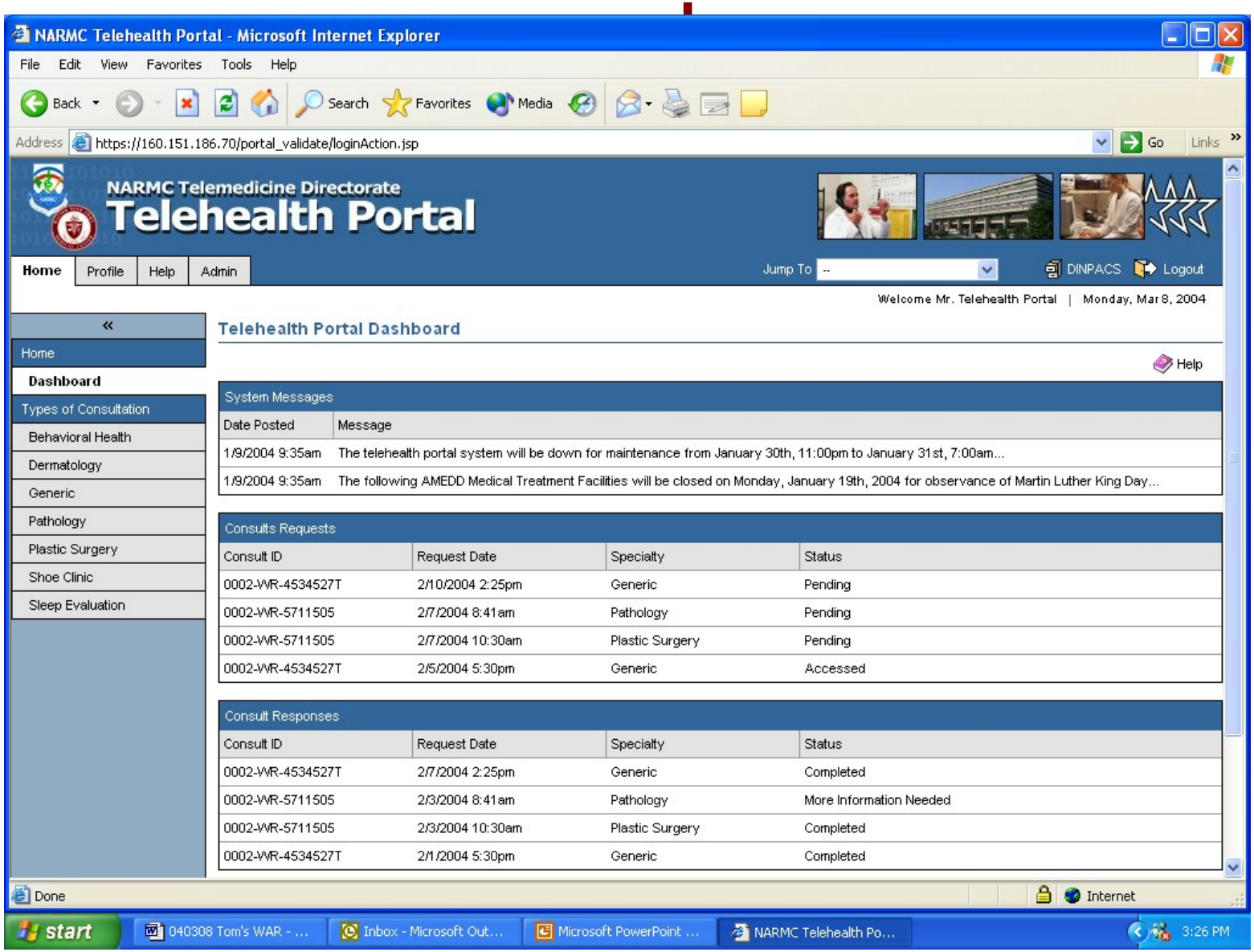
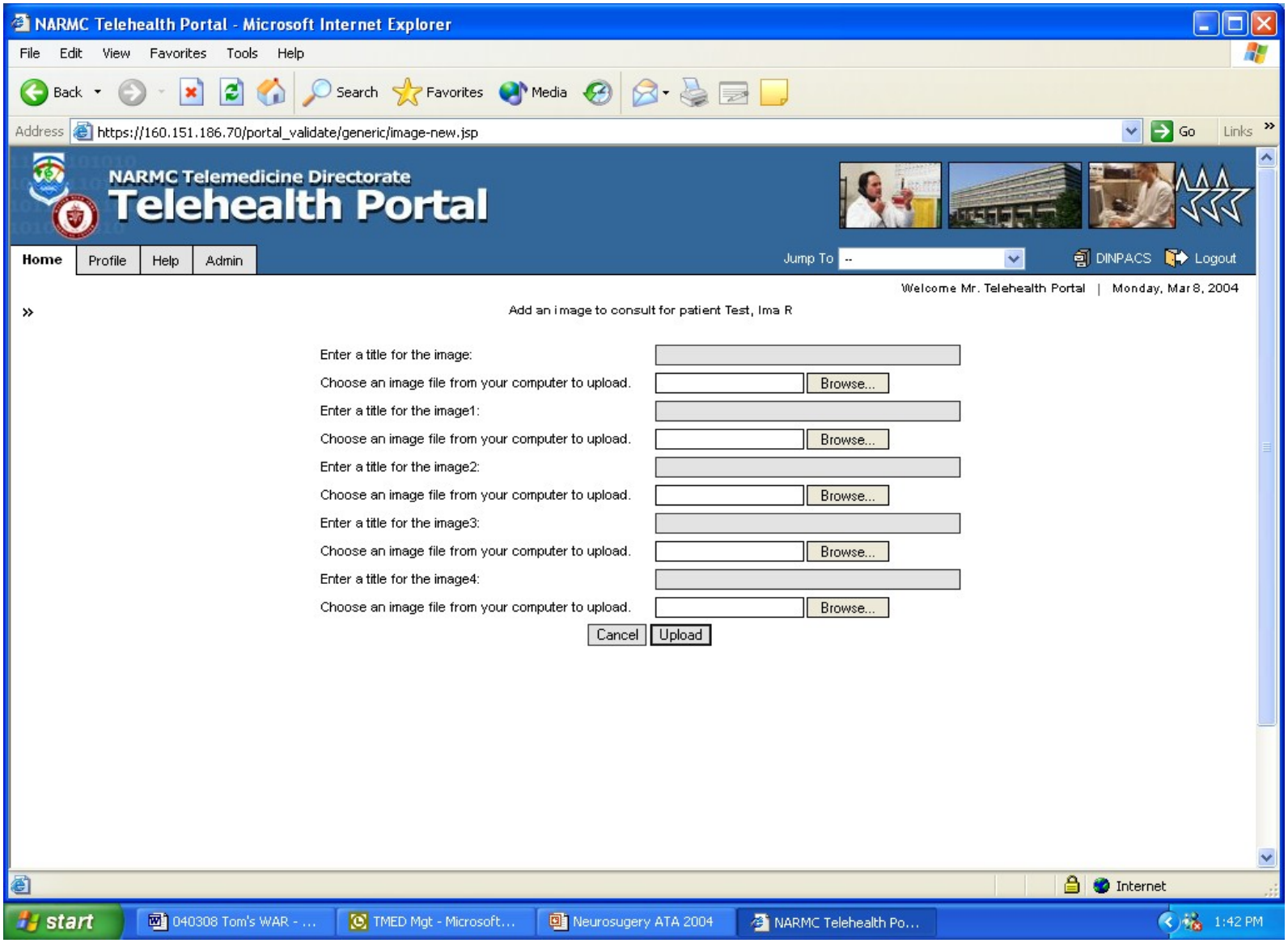
Portal Home Page

Replace this page with new



File Upload Process


NARMC Telehealth Portal - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://160.151.186.70/portal_validate/generic/image-new.jsp
Go Links
NARMC Telemedicine Directorate
Telehealth Portal
Home Profile Help Admin
Jump To
DINPACS Logout
Welcome Mr. Telehealth Portal | Monday, Mar 8, 2004
Add an image to consult for patient Test, Ima R
Enter a title for the image:
Choose an image file from your computer to upload.
Browse...
Enter a title for the image1:
Choose an image file from your computer to upload.
Browse...
Enter a title for the image2:
Choose an image file from your computer to upload.
Browse...
Enter a title for the image3:
Choose an image file from your computer to upload.
Browse...
Enter a title for the image4:
Choose an image file from your computer to upload.
Browse...
Cancel
Upload
Internet
start
040308 Tom's WAR - ...
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Neurosugery ATA 2004
NARMC Telehealth Po...
1:42 PM

Project Results

The U.S. Army Neurosurgical Center provides expert medical consultation and mentoring to clinical staff resulting in:

- Lives Saved
- Reduced Patient Wait Time
- Lower Medical Treatment Costs
- Physicians / Surgeons Better Trained
- Tele-Mentoring of Surgeons Overseas
- Patient Care Extended to Distant Sites
- Increased live access to On-Call Specialist (24/7)